The C-Head® Owner's Manual

Contents of this package

Your C-Head will include the following items.

1. C-Head housing, includes body, toilet seat with lid
2. Collection container
3. Ventilation adaptor hood with screw-in lid
4. 12 ft of ventilation hose and PVC fittings
5. Churn handle
6. Sealing lid (not shown)
7. One gallon water jug

Not included are the following items.

1. Five gallon bucket and locking lid (disposable container)
2. Active or passive ventilation mechanism (12 volt fan or solar vent or dorade cowling)
3. Peat moss or other composting medium

How your C-Head works

Understanding how your C-Head works will help you with the installation. Briefly, the C-Head is comprised of four main components;

1. The housing, toilet seat and lid
2. The collection containers with the churn handle
3. The ventilation hood adaptor and hood lid
4. The ventilation hose and fittings.

Your C-Head toilet separates the liquid and solid waste and dehydrates and initiates composting of the solid waste by moving air through the system. Initially the waste is collected inside the C-Head housing unit in a five gallon collection container where it is processed. When the collection container becomes full (and this is determined by how difficult it is to turn the churn handle) the contents are transferred to a disposable five gallon container where the dehydration and composting continues. When the disposable container is full, it is emptied onto a composting mound or treated with chlorine bleach and capped off with a secure lid and disposed of using the local trash disposal system.

Installing the system

Remove the C-Head from the packaging and check the contents against the packing list by inserting your hand into the urine level viewing slot and lifting straight out of the box and placing your other hand at the back corner of the housing lid.

Types of installation

There are several ways to install the C-Head system. You should determine how you are going to use your C-Head in order to determine the best installation.

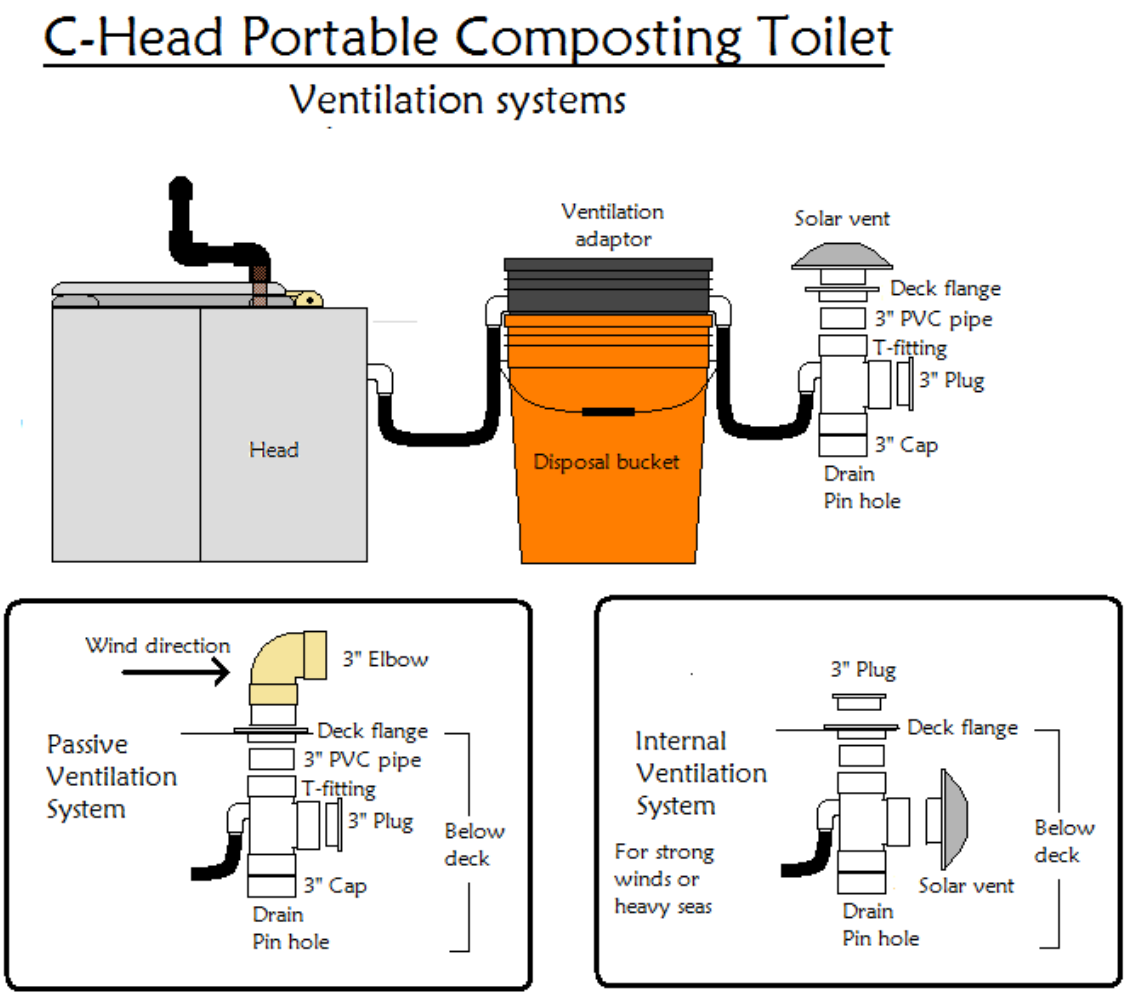
1. Are you going to use it occasionally, such as on weekends?
2. Are you going to use it for longer periods; from a week to a month at a time?
3. Are you going to be using it on a full time daily basis?

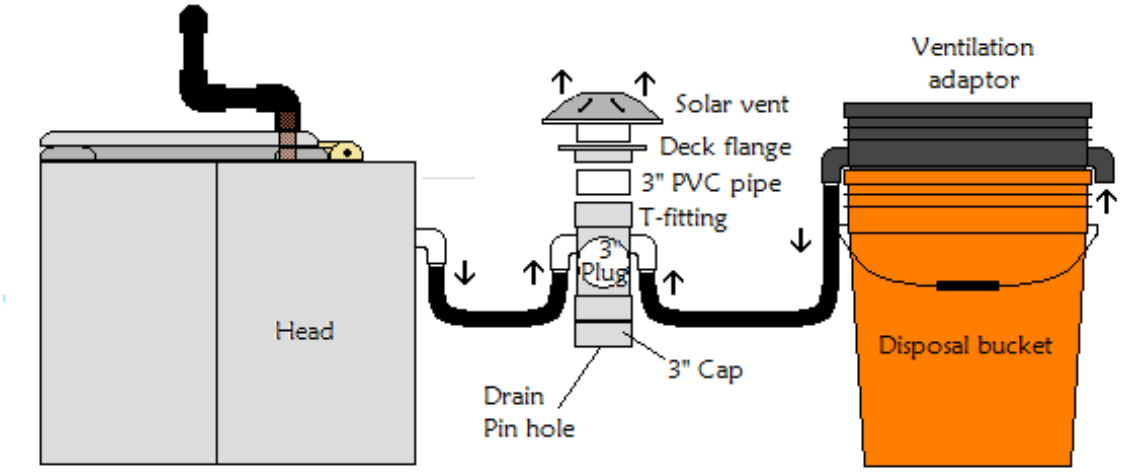
Week-ends – If you are only going to be using your C-Head on week-ends or for just a few days at a time, then you almost certainly do not need to install a ventilation system. As a rule, as long as the waste is covered with peat moss, the smell will be mitigated completely and the dehydration and composting process will proceed without active ventilation. It depends on the temperature and humidity of the area you are in, as well. There may be some slight noticeable musty smell if the weather is very humid or if you must keep the cabin closed. There should never be any type of sewage smell.

If you are installing your C-Head in an RV, camper or horse trailer, then a simple passive venturi system should be adequate if required at all. A stack with a Camco Cyclone or a 360 Siphon on the top should draft the air out of the housing and the smell along with it.

Week to Month – If on the other hand, if you plan on taking seasonal extended trips and using the C-Head on a more consistent basis, then you may need to install a ventilation system from the toilet but probably not from the ventilation hood and disposable container.

Full time Liveaboards – If you are going to be using your C-Head daily and continuously, then you may want to install the system in a method that ventilates both the main housing and the disposable container. One method is to daisy chain the system with the ventilation hose running from the housing to the adaptor hood and then to the solar vent. Here are some drawings of variations on ventilation.





Ventilation

Ventilation is a complicated issue; complicated by the immense variation of applications. I recommend that you try using your C-Head without ventilation first. **You may not need it!** If you have no problem transferring the waste to the disposable container to prevent odor as needed, you may find that you can go a week without any musty odor. The simplicity of emptying the C-Head makes this option available.

If you do decide to ventilate your system, break down the installation into two phases; venting the C-Head housing and venting through the boat.

Venting through just the housing

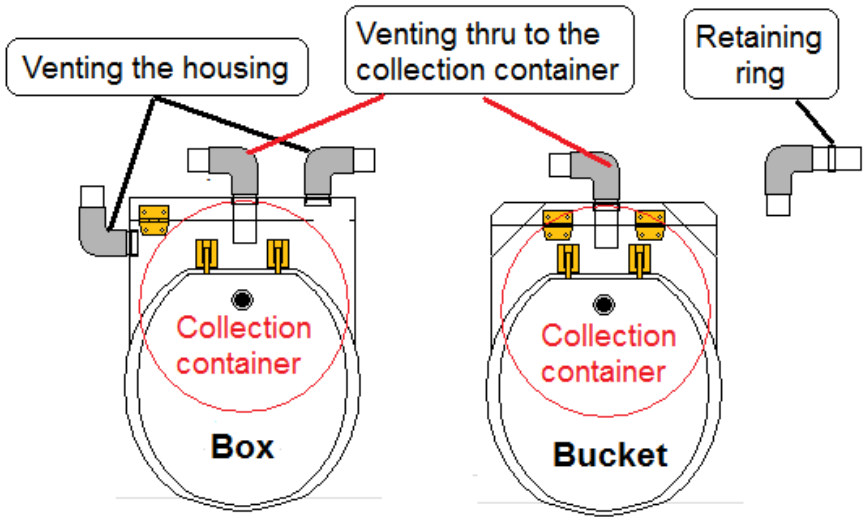
You can ventilate the C-Head housing two ways; either through the housing, or through the housing and into the back of the collection container. First, open up the C-Head housing by lifting the housing lid from the front edge. Remove the urine and solid waste collection containers. Now follow these step by step instructions.

1. Determine the location of the C-Head and install two to four anchor brackets (not supplied) to secure the housing base. The C-Head needs to be installed with its back close to a wall or a vertical surface, to help support the lid when it is open.
2. Determine where you want to attach the ventilation hose on the housing; the back corner or side corner. Cut a 1 3/8-inch hole 3 to 5-inches down from the top edge of the housing (below the housing lid) and 2 to 3-inches away from the corner.
3. Install the supplied elbow by inserting it into the vent hole and sliding the retaining ring over the nipple to secure it. (In the “bucket” model the nipple must be glued to the opening and cut flush with the inside of the housing.) The elbow should rotate as needed with the box model. It is best not cut the hole in the

middle of the back as the collection container will block the vent intake unless you glue it and cut the inside flush as with the bucket model.

4. Re-install the solid waste collection containers inside the housing. Insert an empty gallon water jug so that it is centered and the handle towards the back with one of the flat sides visible through the sight window. This will allow you to monitor how full the jug is.
5. Close the housing lid carefully.

Ventilating through the back and sides



Venting through the housing and into the collection container.

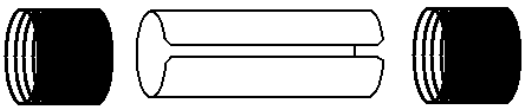
1. Determine the location of the C-Head and install two to four anchor brackets (not supplied) to secure the housing base. The C-Head need to be installed with its back close to a wall or a vertical surface to help support the lid when it is open.
2. To ventilate the system through the collection container, you will have to cut the hole in the back of the C-Head housing *in the center* from the left and right side. Cut a 1 3/8-inch hole 5-inches down from the top edge of the housing lid (not the toilet seat lid!).
3. Temporarily install the collection container and make sure that it is seated correctly to the back. Close the housing lid to secure the collection container in place. Drill a hole into the back of the collection container using the same 1 3/8-inch hole saw, using the hole in the housing as your guide. DO NOT CUT THROUGH THE COLLECTION CONTAINER BUCKET BUT ONLY ALLOW THE PILOT BIT TO PUNCTURE THE COLLECTION CONTAINER.
4. Remove the collection container and using the pilot hole you just made, cut a larger hole in the back of the collection container using a 1 3/4-inch hole saw.

5. Install the supplied elbow (with the long nipple) by inserting the long end into the vent hole from the back and sliding the retaining ring over it to secure it to the housing. The elbow should rotate as needed to align with the vent hose.
6. Re-install the collection containers inside the housing. Insert an empty gallon water jug so that it is centered and the handle towards the back with one of the flat sides visible through the sight window. This will allow you to monitor how full the jug is.
7. Close the housing lid carefully.

Attaching the Ventilation hoses

1. Attach the ventilation hose onto the elbow that vents the toilet housing.
2. Run the hose to a ventilating mechanism or run it to the disposable container vent hood. The location and type of ventilation installation are at your discretion.
3. Insert the vent hood into a disposable 5-gallon bucket and lock it to the disposable container using the side latches on the hood. Secure the bucket at its location if needed. A simple line or strap, secured to a bulkhead and tied or clipped around the upper portion of the disposable bucket should suffice. Make sure that you have adequate room around the top to pour the collection container contents into the vent hood. Store the disposable bucket in an area that is not subject to temperatures above 90F degrees.
4. Connect the ventilation hose to the vent hood and then to the ventilation mechanism if odor from the disposable container becomes a problem.

Next you will need to route the ventilation hose. The ends of the two supplied hoses are designed to fit over the existing barbs. If you need to shorten a section of hose, cut a piece out of the *middle* and then insert a sleeve and join the two sections with black electricians, Atomic or Gorilla tape, or epoxy glass. Do not just cut off one of the ends to shorten the hose.



The package comes with one 12-foot section of hose that is actually two sections of 6 foot each. Several sleeves are supplied so you can add to one by using a section of the other. In all, you will need two sections, one to run from the housing to the adaptor hood and one to run from the adaptor hood to the solar vent or deck fitting. Since it is not possible to sell a ventilation kit for every kind of boat, you will be required to make some adaptations yourself. If you are not handy with such installations, then we suggest you contract someone who is. If you have questions about your installation, call us and

we will try to help you make the best decision. Be prepared to photograph and e-mail pictures of your situation.

If you are installing your C-Head inside a shower stall, then it is best to keep it covered while you are showering. A fitted fabric cover is the best option but a plastic bag can be used also. If you choose to leave it uncovered while showering, it should be wiped down after getting wet and you should not allow water to enter the collection container.

Handling peat moss or other fibrous materials

There are many substances that are suitable as a composting medium; sawdust, wood shavings, coconut husks, etc., but I have had very good success with the old standby, peat moss or sphagnum moss. It is cheap beyond belief and once you get the hang of it, it is easy to work with. At first you will probably sprinkle it all over everything every time you touch it, and that can be frustrating. It will hose off easily enough but you can avoid this problem with careful handling. Here's my method.

Peat moss will come in a plastic bag either compressed or loose. It really isn't necessary to carry around the whole bag. A 5-gallon bucketful will last a long time. Cut open the bag and pour it into the bucket on land or in an area where any spillage won't matter. You may also choose to use a different container if you find one that fits somewhere nicely on the boat. We actually use a rectangular rubber bin that fits right where the old holding tank used to be.

Nut Jars! Either go to Costco/Sam's Club/BJs and buy a couple jars of nuts and eat the nuts or go to Wal-Mart/K-Mart/Target/etc or a container store and buy some wide mouth plastic quart jars. The jar you received with your C-Head came from Walmart.

Use a small plastic cup or flour scoop (that you keep in the compost container) to fill up the quart jars and store them in the head area. The mouth of these jars fits nicely inside

the opening of the C-Head and you can pour out half at a time without spilling any. Once you clear this hurtle, managing the composting material becomes fun and easy.

If you are looking for an alternative to peat moss and coconut coir (and one that is compact) look at equine pine wood pelletized bedding.

Coconut Coir

Horse Pine Pellet Bedding

Pine Pellets

It is available at almost any horse tack store and Tractor Supply stores for about $7 for 40 pounds. It is very inexpensive and easy to store. Just add water and it turns to dry pine sawdust. It doesn't really compost but desiccates, since it lacks bacteria, but if you are looking to use it as a storage and drying medium, which most of us are, it works great for covering and dehydrating the solid waste.

Composting medium additives

If you live in an area that is prone to flying insects or you keep a lot of fresh fruit onboard your boat, you can eliminate the prospect of them migrating to your collection container by adding diatomaceous earth to the mixture. It is easily obtained at any box store in the pool supply section. A twenty dollar 24 pound bag will give you a two year supply if you add one cup to the collection container mixture when you recharge it. It also seems to aid in reducing the musty odor of compost. It is non-toxic to humans in anything less than massive doses but lethal to insects. It works mechanically so it does not lose its potency and insects cannot develop a resistance to it. Only use this if they become a problem.

DE is bulky, heavy and dusty and does not break down, so it is around for a long time. Also, some insects that it kills are beneficial such as black soldier flies and their larva, which control the housefly population and break down the waste significantly. DE has also been known to kill earthworms. An alternative method of complete control is by using a "Hot Shot No Pest Strip2" placed inside the housing of your C-Head or BoonJon toilet. It is not recommended that you leave the No

Pest Strip inside the toilet longer than needed. You should also allow some ventilation in the toilet area (bathroom), as much as possible. The instructions state that it should not be used in an area where people will be present for more than four hours a day, but this is using the full evaporation rate of the strip inside a house where ventilation is restricted to the interior of the structure. If you live on a boat, chances are that you are getting a lot of ventilation from open hatches, so there should be little concern. The DOT hazard placard indicates 1-1-0-0 which is pretty benign. But here is how you do it.

1. Cut the end off of the foil package and remove the strip, which is a plastic tower with holes in it running from top to bottom.
2. Slide the foil package back over the top exposing only the bottom area about a half of an inch, so that you are restricting the evaporation rate of the strip. Raise the cover to expose more of the strip if needed.
3. Tape the package covered strip to the inside wall of the housing if you are in a moving vehicle, or simply set it in the back corner of the toilet housing outside the solid waste collection container. Wash your hands.
4. You will see immediate results but after 10 days, the gnat egg population will have been completely eradicated, so remove the strip and reseal the package for reuse in the future.

The active ingredient is Dichlorvos, an organophosphate. Organophosphates are chemicals commonly used in insect control but they are toxic and can be absorbed through the skin. In addition to killing flying insects, they also kill roaches and other invasive insects. Here are the MSDS and CDC links. Humidity found inside the collection container will quickly break down Dichlorvos and render it harmless. Restricting the evaporation by covering most of the strip should have a significant effect in limiting exposure to the chemical. The small space inside your C-Head or BoonJon housing will only require a very small amount of the chemical in order to be very effective and will contain the evaporation until the humidity breaks it down. The end result is an easy and inexpensive means of pest control. Read the directions. Use your own judgment.

Venting outside the boat.

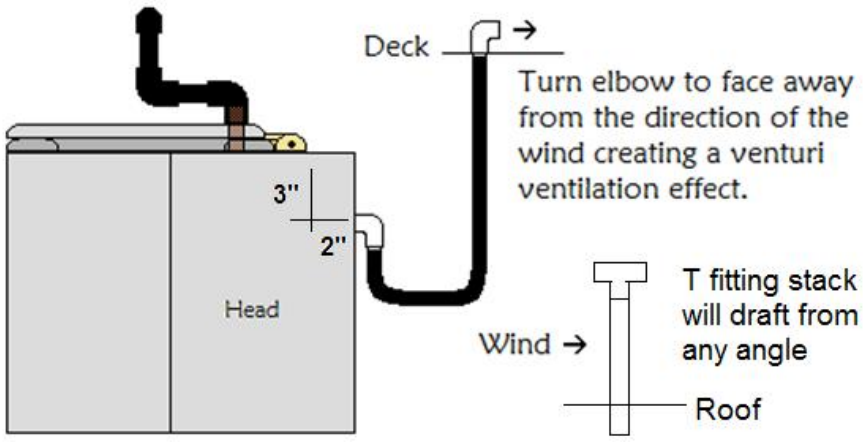
Since every installation is different and every owner has different skills and preferences, each ventilation system will have to be custom designed by the owners. In short, ventilate the C-Head housing by running the ventilation hose from the back or side of the housing to either the inside of an on deck locker (such as a sail locker) or through the deck or coach roof. If you vent to a locker then you will need to actively ventilate the system using a small 12-volt electric mini fan.

Google “mini 12-volt fans” and several sources will come up. Expect to pay between six and twenty dollars for a fan of this size. For a boat, you shouldn’t need one any larger than 2 ½ inches by 2 ½ inches. It does not need to move a large volume of air so choose one that has low wattage and low noise. If you vent the head through the deck or coach roof, then you have the option of:

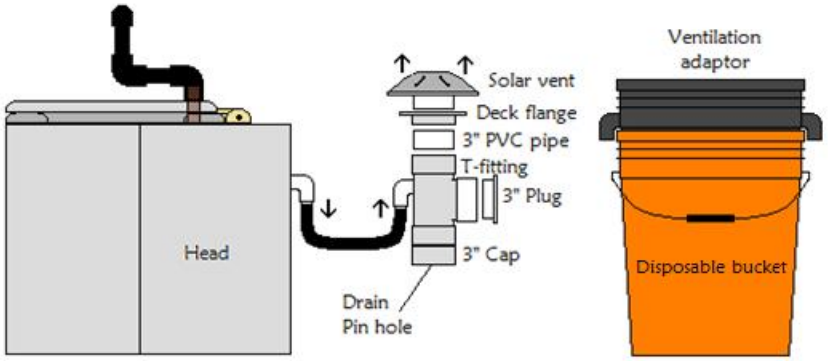
1. Active ventilation using a 12-volt mini fan
2. Active ventilation using a solar vent
3. Passive ventilation using a dorade box or cowling (works best for vessels that are continuously at anchor and have some breezes or wind)

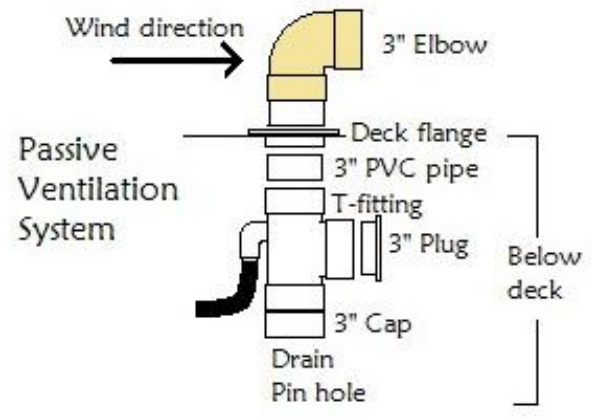
Active ventilation systems force air through the system using some kind of fan. Passive systems use the venturi effect to draft air through the system and require only a slight breeze to operate.

Passive Ventilation System



Personally, I like the solar vent since it is virtually maintenance free and does not contribute to drawing down your batteries. You will however need to replace the solar vent with a cap when off shore and you may need to replace it with a cowl when the winds are strong. Strong winds (20 knots sustained) can sometimes overpower the fan in a solar vent and cause the air to flow backwards, filling the cabin with a musty smell. Replacing it with a deck cowl will instantly ventilate the cabin and remove the smell. A standard 3-inch PVC elbow with a short 6-inch section of pipe attached will fit perfectly into the flange provided by Nicro with their solar deck vents. We have used this method successfully for two years.





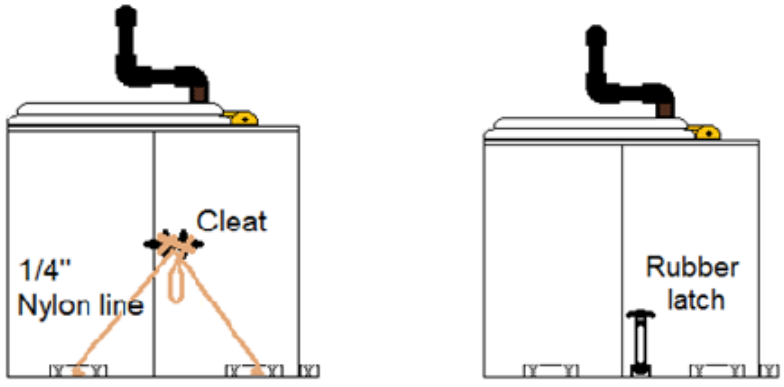
You do not need to actively ventilate the disposable container to avoid odor. Once the waste has gone through the initial processing in the collection container, it will not smell like sewage after that but it will smell musty when the container is opened. Simply clip the adaptor hood over the 5-gallon bucket so that it can breathe and that will keep the bugs out and the musty smell in. Accumulated waste from the collection container can be transferred into the disposable container continuously until the disposable container is full.

However, without ventilation, condensation may form on the underside of the lid of the disposable container hood which can drip when you remove it. This is a nuisance and if you are living aboard permanently, you will probably want to ventilate the disposable container to avoid this. If you choose not to ventilate the disposable container, you should rap the lid sharply with your hand before opening it. This will cause the formed droplets to drop down into the bucket and then you can remove the lid without the mess.

Anchoring Methods - You will need to install the C-Head housing first. You will have determined beforehand where your C-Head will fit in your boat, RV or camper. By law, even though the C-Head is designed to be portable, it must be anchored when used in a boat to secure it against spills due to heavy seas or collision.

The C-Head is secured from shifting laterally with either angle metal, plastic or wood brackets that surround the base of the housing and are attached to the floor. The unit is held down using a tie down system to prevent it from lifting up and out of the bracketed area. The C-Head comes with six to eight rubber non-skid feet that may suffice instead of using brackets. The installation will dictate whether or not brackets are needed. A tie down will still be required. The rubber feet may be easily removed if needed by simply peeling them off the base.

Another method that has more of a nautical appeal would be cleat and line. Here a loop of line is attached to the cabin sole and fed through the hole in a cleat attached to the side of the housing (use a ½" back-up block inside) and then tied off with a figure eight. Both are quick and easy ways to detach the entire housing and support the idea of its "portability". Portable toilets, constructed of rigid materials and designed to have the waste manually carried away, do not require certification by the USCG and are an acceptable waste management system by law enforcement on almost all bodies of water in the USA.



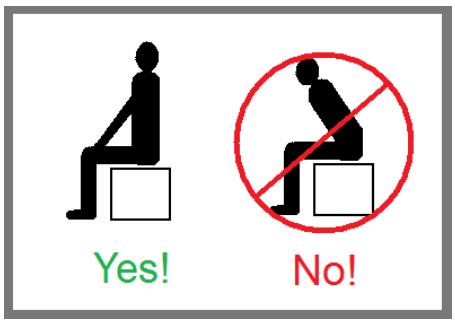
You should never anchor the housing by bolting or screwing through the housing floor (the pan) into the pedestal. This may undermine the integrity of the pan and could also cause damage to the housing through stress.

Using the C-Head

As with any composting, moldering or desiccating head, separation of the liquid and solid waste is imperative. The C-Head is designed to make body alignment as easy as possible. For best results, men should always use the C-Head in the sitting position as opposed to standing.

In the case of women, the first uses of the C-Head may require special attention, but after a few uses, you should develop a feel for proper alignment and you will become more comfortable and confident as time passes.

When urinating (both men and women), you should hear a trickle. If you don't, be sure to check the level of the gallon jug. As the sound diminishes as the jug becomes full.



Always sit upright on the seat. Don't lean forward. The opening to the collection container is designed for this type of seating arrangement. If some solid waste is left on the sides of the opening, simply wipe it off with a small piece of toilet paper and discard the paper in the hole or a trash receptacle. Spray "Lysol with bleach" (or your favorite non-caustic household cleaner) into the funnel and around the rim occasionally to keep odor away and to sanitize the surfaces. You may also opt to use a deodorizer such as Zepp or Febreze occasionally. Simply spray inside the funnel a squirt or two.

Toilet paper can be discarded in the collection container, however this can be unsightly and will cause you to empty the collection container more often. If you discard it in the toilet, use the least amount possible. It is better to discard your toilet paper in a small waste basket lined with a plastic grocery bag and covered with a lid just as we had done with a holding tank system.

Close the toilet seat lid and insert the churn handle and rotate it relatively quickly in a clockwise direction for about **15-20 full turns**. The handle is best started and finished in the **three o'clock position**. The white arrow head on the churn handle indicates the direction to turn it. Churning in the wrong direction can damage the churn.

As the collection container begins to fill up, turning the churn handle will meet more resistance. You will develop a feel for when it is time to empty the collection container by the level of resistance. Usually the collection container will be about a quarter to a third full when it needs to be emptied. The C-Head is easy to empty and you should just empty it anytime you feel you need to. Don't make it a contest to see how much it will hold.

If for some reason, a large amount of urine enters the solid waste collection container, the compost will become wet and smelly. To remedy this situation, add peat moss to the collection container and churn it until the compost is of a consistency that can be poured out into the disposable container. Once transferred, cover the mixture with additional

peat moss. Otherwise, seal and discard the container. If possible rinse out the collection container before refilling with peat moss.

Again, separation of the waste is critical but not difficult to attain with usage.

Now to address a couple of special and sensitive issues;

1. Vomiting – vomit overboard or in an empty 5-gallon bucket, not in the toilet.
2. Diarrhea – Diarrhea is a problem regardless of which waste management system you have. With a holding tank system, the frequency associated with diarrhea can cause you to fill your holding tank more quickly than would normally be the case. With composting systems, chronic diarrhea can cause a mess that will have to be cleaned up. If you are using the C-Head system, then you are probably well on the way to incorporating 5-gallon buckets for a variety of uses aboard your boat, so one should be relatively handy and available. If you have diarrhea, use a separate bucket by itself and cover the contents with peat moss after each use. Then pour an ounce of chlorine bleach into the mix and either seal and discard the contents as soon as possible or wash/rinse the bucket out where permitted. Another option is to lift the seat and dampen the rim with a damp wash cloth and then drape toilet paper over the edges into the opening. This can be done before hand if you know you are sick and then you will not be caught off guard by urgency. When finished, push the paper into the opening and re-line the opening with TP if needed.
3. Flies – As previously noted, an occasional problem with composting toilets is fruit flies, sewer flies and house flies. Here again, the C-Head excels over its competitors in helping eliminate this problem. All of these pests develop because they use moist fermenting waste to lay their eggs in. Once they become established, the source must be completely cleaned.

   This problem is avoided with the C-Head for several reasons.

1. The C-Head is emptied more often, removing any eggs and larvae before they can turn to flies and reproduce.
2. The C-Head is a dehydrating system which removes the moisture needed to support the flies, and which facilitates the removal of almost all of the medium when emptied. The collection container is easy to rinse out if needed.
3. Should an infestation begin, the C-Head can be quickly and easily cleaned to destroy all the eggs and larvae. If you are using your C-Head on a boat, simply empty the collection container, then tie a line to it and drop it overboard to soak for several hours, then allow it to dry and reinstall. *Never dispose of food scraps in a composting toilet. This is a primary source of fly infestation.*

Disposing of solid waste

Once the composted waste material has filled the disposable container to within two inches of the top (the bottom rim of the vent hood), remove the vent hood and place it in a new bucket. If you are going to dispose of the waste, pour one cup of liquid chlorine

bleach into the mixture and then simply snap a locking lid tightly over the top using a hammer or heavy item. Take an awl or screwdriver and poke a hole into the lid for the escape of the gasses. Discard the container as soon as possible in as secure a place (such as a dumpster) or set it out for curb side service just prior to pick up.

If you are going to compost the waste further, *do not use chlorine bleach* and use a "snap on" lid instead of a locking lid. Set aside until you can move it ashore to a composting mound.

Safety Note

Peat moss and other organic matter are subject to spontaneous combustion when stored wet in very large amounts. It is virtually impossible for a five gallon container full of peat moss to spontaneously ignite and there are no recorded incidents of this happening that I am aware of. If this were a serious hazard then we would have frequent fires at most garden suppliers where bags and mounds are stored in the rain and direct sunshine. Nevertheless, as a matter of general safety, it is probably wise to never store composted waste in a place where high temperature extremes are likely to occur.

Keep hand cleaner handy and use it each time you handle the contents inside the housing or just wash your hands.

Disposing of liquid waste

At an average normal rate of one to two quarts/liters a day, the one gallon container on the C-head will have to be emptied daily or every other day for a crew of two persons. The urine in the gallon container can be transferred to another larger container, or taken ashore and disposed of, or in some cases where legal dumped overboard.

Another option is to store the full gallon container and replace it with another empty one. Using smaller one-gallon containers allows the use of small spaces to store it in, until it can be properly disposed of. As long as it is capped and not allowed to sit for long periods of time, odor will not be an issue and the older gallon jugs can be easily replaced with new empty water jugs.

The best system for urine odor control is to mix an ounce of Thetford Campa Chem (formaldehyde free) with water in a dishwashing liquid bottle and squirt a shot (about one ounce) around the inside of the urine diverter after each use. This will totally eliminate any urine odor. Some people say that a sugar water does the same thing but it takes a large amount and is more expensive. Controlling the odor makes transferring the urine into a toilet less offensive to bystanders.

Unless you use it for gardening, urine should always be emptied out of the gallon jugs into a receptacle designed to accept human waste, if possible, such as a toilet or urinal. The jugs should be recapped before they are discarded, even if they are crushed. Using sanitary practices will insure the popular support for composting toilets as a safe and clean alternative to liquefying waste for disposal.

Cleaning your C-Head

You may use any of several standard household cleaners and degreasers that are available on the market. The collection container should be washed occasionally. The collection container is all plastic except for a few stainless steel fasteners. You may choose to fill it with water prior to cleaning it to soften up dried out waste. A standard toilet bowl brush should work fine.

Once clean wipe down the inside of the C-Head housing with a light solution of Clorox and water or use Lysol spray with bleach. For best results, spray the inside of the collection container with silicon spray after it has dried. This will make the next cleaning easier and help prevent waste from sticking to the sides of the container. Use only a mild detergent on the outside of the housing; *never use solvents or abrasives*!

If a urine spill happens from overfilling or a failed container, soak up the urine with a rag or sponge and rinse out the pan with water. Use gloves. Then wipe down the inside of the housing with a light mixture of Clorox and water or "Lysol".

Help us! - As you can see, the C-Head is simple and safe, and once you learn the ropes, you will see how convenient it is compared to other systems. Please feel free to join the discussion group online through our Yahoo Group at:
http://groups.yahoo.com/group/C_Head/

If you are especially proud of your installation, please post pictures on that site to assist others with their installations. Happy cruising, camping, riding or traveling and thanks again for purchasing the C-Head Portable Composting Toilet.